| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/608,395 | 06/30/2000 | Per-Ake Larson | MS1-479US | 9668 |

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| EXAMINER |
|---|
| NGUYEN, CINDY |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2171 | |

DATE MAILED: 01/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

| | Application No. | | Applicant(s) | |
|---|---|---|---|---|
| **Office Action Summary** | 09/608,395 | | LARSON ET AL. | |
| | Examiner | | Art Unit | |
| | Cindy Nguyen | | 2171 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☒ Responsive to communication(s) filed on *20 December 2002* .

2a) ☒ This action is **FINAL**.    2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) ☒ Claim(s) *1-26* is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-26* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on *12-20-2002* is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

     If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a) ☐ All b) ☐ Some * c) ☐ None of:

         1. ☐ Certified copies of the priority documents have been received.

         2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

     a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

## DETAILED ACTION

This is in response to amendment filed on 12/20/2002.

### 1.    *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis

for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2.    **Claims 1, 8, 9, 11 , 12, 17, 19, 21 and 24 are rejected under 35 U.S.C. 102(b) as being**

**anticipated by Dalal (U.S. 5781896)..**

In consideration of claims 1 and 21, Dalal discloses: A method and computer program for

processing a database query according to at least one grouping column value (see col. 4, lines 1-10,

Dalal), the method comprising:

partially pre-aggregating records in a database according to a single grouping

column to provide a result that contains at least two records having like grouping column values

(see Fig. 10, and corresponding text, Dalal); and

aggregating records derived from the partial pre-aggregation to provide a

result that contains records having unique grouping column values (see 1100, Fig. 11,

Dalal).

Regarding claim 8, the limitations of this claim have been noted in the rejection of claim 1. Applicant's attention is directed to the rejection of claim 1 above. In addition Dalal discloses: wherein the partially pre-aggregating includes utilizing a hashing function (see col. 5, lines 45-49, Dalal).

Regarding claim 9, the limitations of this claim have been noted in the rejection of claim 1. Applicant's attention is directed to the rejection of claim 1 above. In addition Dalal discloses: wherein the partial pre-aggregating creates a record store in memory, and wherein the method further comprises utilizing the record store in memory for one or more other database operators (see Fig. 3 and corresponding text, Dalal).

Regarding claim 11, the limitations of this claim have been noted in the rejection of claim 1. Applicant's attention is directed to the rejection of claim 1 above. In addition Dalal discloses: computer programmed to perform the method recited in claim 1 9 (see col. 2, lines 62-65, Dalal).

Regarding claim 12, the limitations of this claim have been noted in the rejection of claim 1. Applicant's attention is directed to the rejection of claim 1 above. In addition, Dalal discloses: A relational database system, comprising: memory for storing a record store ,the memory having a portion available for query processing (see 320, Fig. 3, Dalal).

As per claim 17, all the limitations of this claim have been noted in the rejection of claim 9. It is therefore rejected as set forth above.

As per claim 19, all the limitations of this claim have been noted in the rejection of claim 8. It is

therefore rejected as set forth above.


### 3.      *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set

forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102
> of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject
> matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art
> to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.


**4.      Claims 2-5, 13-15, 20 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable**

**over Dalal (U.S.5781896) in view of Larson (U.S. 6115705).**


Regarding claims 2 and 13, all the limitations of this claim have been rejected in claim 1

and 12, in addition, Dalal discloses: wherein the partially pre-aggregating further comprises:

maintaining a record store in memory (see col. 4, lines 11-12, Dalal), the record

store having one record for each different grouping column value encountered in the

operation(see col. 4, lines 19-24, Dalal);

Dalal is silent as to the provision of receiving a new record after the final aggregation step is

performed. However, Larson discloses receiving a new record (see col. 6, line 28, Larson); combining

the new record with a record having the same grouping column value, if such a record exists; and

adding the new record to the record store in the memory if there is no record in the record store that has

the same grouping column value as the new record (see col. 6, lines 50-65, Larson). Because Dalal's

system is designed to be repeated by a user and is dynamic in nature, it would have been obvious to

one of ordinary skill in the art to receive a new entry in Dalal as taught by Larson, so as to facilitate

continuous and expanded use of further search queries.

As per claim 3, the limitations of this claim have been noted in the rejection of claim 2.

Applicant's attention is directed to the rejection of claim 2 above. In addition, Dalal/Larson disclose:

adding additional new records to the record store until the record store reaches a capacity such that it can

accept no new records (see col. 7, lines 36-47, Larson); outputting one or more records from the record

store to a subsequent database operator (see col. 10, lines 53 to col. 11, lines 4, Dalal). Therefore, at the

time the invention was made, it would have been obvious to a person of ordinary skill in the art to

include a method of processing the query steps of aggregation using hashing and partitioning to process

until there is no more free space in memory in Dalal, as taught by Larson. The motivation being to have

enabled a user to provide a method and system in a computer system to identify grouping column

contents into a result value for the identified grouping column contents reducing the disk access

overhead incurred in performing the aggregation.

Regarding claim 4, the limitations of this claim have been noted in the rejection of claim 3.

Applicant's attention is directed to the rejection of claim 3 above. In addition, Dalal/Larson discloses:

wherein after the one or more records have been output to the subsequent database operator, the adding

and outputting are repeated until there are no new records to process (see col. 11, lines 5-22, Dalal).

Regarding claim 5, the limitations of this claim have been noted in the rejection of claim 4.

Applicant's attention is directed to the rejection of claim 4 above. In addition, Dalal/Larson

discloses: wherein any records remaining in the record store after there are no new records to

process are output to the subsequent database operator (see col. 10, lines 53 to col. 11, lines 4,

Dalal).


As per claim 13, all the limitations of this claim have been noted in the rejection of claim 2. It is

therefore rejected as set forth above. In additional, Dalal/Larson discloses: receive an input record from

the non-volatile memory (see 54, Fig. 7, Larson).

As per claim 14, all the limitations of this claim have been noted in the rejection of claims 3 and

claim 13. It is therefore rejected as set forth above.

As per claim 15, all the limitations of this claim have been noted in the rejection of claims 4 and

5. It is therefore rejected as set forth above.


Regarding claim 20, all the limitations of this claim have been rejected in claim 12. Applicant's

attention is directed to the rejection of claim 12 above. In additional, Dalal/Larson discloses: wherein

the query processor is further configured to utilize hashing and partitioning to perform the partial pre-

aggregation (see abstract, Larson).


As per claim 22, all the limitations of this claim have been noted in the rejection of claims 2, 3

and 4. It is therefore rejected as set forth above.

Regarding claim 23, all the limitations of this claim have been rejected in claim 12. Applicant's

attention is directed to the rejection of claim 12 above. In additional, Dalal/Larson discloses: further

comprising database operator code that utilizes the record store for input (see col. 11, lines 1-39,

Larson).

Regarding claim 24, most of the limitations of this claim have been noted in the

rejection of claims 1 and 21. Applicant's attention is directed to the rejection of claims 1 and 21

above. In addition, Dalal/Larson discloses: executable instructions (see Fig. 7 and

corresponding text, Dalal), when executed on a computer, perform the following steps: receiving

a stream of input records (see col. 7, lines 13-22, Dalal);

aggregating the input records in the stream to a single grouping column as it is received

to create a record store (see col. 7, lines 49-57, Dalal).

Outputting the records in the record store after the join (col. 7, liens 36-48, Larson);

Aggregating the records output from the join; and Wherein the records output from the

join include at least two records that have an identical grouping column value in the single

grouping column (col. 5, lines 47-60 (Larson). Thus, at the time invention was made, it would

have been obvious to a person of ordinary skill in the art to include the step of aggregating the

records output have at least two records that have an identical grouping column value in the

system of Dalal as taught by Larson. The motivation being to enable the user to group the data

with the result contains an unique value in the aggregated grouping column.

As per claim 25, all the limitations of this claim have been noted in the rejection of claims 3 and

24, above. It is therefore rejected as set forth above.

5.      **Claims 6, 7, 10, 16, 18 and 26 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Dalal (U.S.5781896) in view of Larson (U.S 6115704), and further in view of Srivastava et al. (U.S. 6032144).**

Regarding claim 6, all the limitations of this claim have been rejected in claim 3. Applicant's attention is directed to the rejection of claim 3 above. However, Dalal didn't disclose the join operation. On the other hand, the background of Srivastava et al. disclose: wherein the subsequent database operator is a join (see col. 2, 25-39, Srivastava et al.). Thus, having the above teaching from Srivastava et al., it would have been obvious to a person of ordinary skill in the art to include the step of computing cost estimates using the join operator in the method of aggregation as taught by Srivastava et al. Accordingly, it would have been obvious to incorporate the teachings of aggregation in database table of the combination system of Dalal and Larson. The motivation being to have enabled a user to reduce the disk access overhead incurred in performing the aggregation.

Regarding claim 7, all the limitations of this claim have been rejected in claim 1. Applicant's attention is directed to the rejection of claims 1 and 6 above. In addition, Srivastava et al. discloses: further comprising estimating the costs and benefits of the partial pre-aggregation, and partially pre-aggregating the records only if the estimating indicates that the benefits are greater than the costs. (see col. 5, lines 49-57, Srivastava et al.).

Regarding claim 10, all the limitations of this claim have been rejected in claim 1. Applicant's attention is directed to the rejection of claims 1 and 6 above. In addition, Srivastava et al. disclose: one

or more computer-readable media having computer-executable instruction ( see Fig. 3 and

corresponding text, Srivastava et al.)

As per claim 16, all the limitations of this claim have been noted in the rejection of claim 6. It is

therefore rejected as set forth above.

As per claim 18, all the limitations of this claim have been noted in the rejection of claim 7. It is

therefore rejected as set forth above.

Regarding claim 26, all the limitations of this claim have been noted in the rejection of claim 24.

It is therefore rejected as set forth above. In additional, Srivastava et al. disclose: determining if it is

optimal to aggregate the input records prior to performing the join (see col. 2, lines 54-64, Srivastava et

al.),   Performing the aggregation prior to the join only if a determination is made that it is optimal to

perform an aggregation prior to the join (see col. 7, lines 47-55, Srivastava et al.).

### 6.      *Response to Amendment*

Regarding claims 1, 12, 21 and 24, at pages 10-13 of the response filed 12/20/02,

Applicant argues: Dalal does not disclose or anticipate a partial aggregation or partial pre-

aggregation.  In response, the multiple aggregation query in Dalal is a query that utilized more

than one grouping column, aggregating one grouping column at a time, sequentially-this is

clearly partial aggregation (col. 10, lines 7-66, Dalal).

Regarding claim 24, at page 13 of the response filed 12/20/02, Applicant argues:

"wherein no records output from an aggregation contain an identical value in the grouping

column". In response, Larson disclose: wherein the records output from an aggregation contain an identical value in the grouping column (col. 5, lines 47-60 (Larson) and please see the rejection of claim 24 above.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

### 7.    *Contact Information*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cindy Nguyen whose telephone number is 703-305-4698. The examiner can normally be reached on M-F: 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Safet Metjahic can be reached on 703-308-1436. The fax phone numbers for the organization where this

application or proceeding is assigned are 703-746-7239 for regular communications and 703-746-7240

for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should

be directed to the receptionist whose telephone number is 703-305-3900.

*cN*

Cindy Nguyen
January 27, 2003

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